

REMARKS

In an Office Action mailed September 16, 2003, pending claims 1-9 and 20-26 were examined. Claims 1-6, 8 and 20-25 were rejected and claims 7, 9 and 26 were objected to. The drawings filed on February 13, 2002 were accepted. In response, Applicants are herein amending claims 1, 2, 4-7, 9, 20, 24 and 26 and respectfully request the reconsideration and allowance of claims 1-9 and 20-26. A fee in the amount of \$258 is authorized above for three newly added independent claims in excess of three.

The election Applicants made in Paper No. 4 was without traverse as was evidenced by the cancellation of non-elected claims 10-19. Applicants continue to reserve the right to timely file a divisional application.

Claims 1, 2, 4, 5, 6, 8, 20, 21, 22, 23 and 24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hirt et al. (U.S. Patent 6,590,410). Hirt et al. disclose a contactless test of an integrated circuit. In each section of the integrated circuit, as illustrated in FIG. 5, there is an LED result indicator 88. Photosensors, as designated by rectangular symbols in FIG. 5 are used to provide contactless test inputs to each of a variety of sections. Because the sections may be segregated structurally, LED result indicators 88 are required to be widely populated and exist in every portion of the integrated circuit that requires testing. In contrast, as amended herein, the rejected claims recite test circuitry that is contained on a die and that is dedicated specifically for testing an associated die. Further, a visual functional indicator is provided that indicates functionality of multiple circuit modules of the integrated circuit. Therefore, the inventive test apparatus of claims 1, 2, 4, 5, 6, 8, 20, 21, 22, 23 and 24, as amended herein, provides a visual test mechanism that can be used for multiple portions or modules of an integrated circuit without having to replicate the visual indicators a large number of times. In addition to the space that is dedicated to numerous visual indicators, any optical sensing circuitry does not have to be as highly calibrated to detect the visual indicators of a visual indicator that is shared among numerous circuit modules. Hirt does not teach or suggest recording a visual functional indicator "on or after a predetermined time after receiving the test enable signal." The recited method of

claim 1 therefore permits reliable recording of test circuitry whether the circuitry is synchronous or asynchronous as the timing of the visual recording is made reliable regardless of timing variations within the test circuitry. Additionally, in claim 20 there is recited a dedicated built-in self-test circuit that is not taught or suggested by Hirt that teaches away from such circuitry by using a contactless test circuit. In claim 24 there is recited an "enabling the test circuitry with an enable signal applied to an input of each of the plurality of multiple die" and "using imaging means to inspect each visual functional indicator and record test results". Hirt does not teach or suggest these recited features of claim 24. For example, Hirt provides a result output that is a single bit or a series of bits for multiple results and these results are stored in a result register or linked to a common point on the wafer. Applicants respectfully request the reconsideration and allowance of claims 1, 2, 4, 5, 6, 8, 20, 21, 22, 23 and 24, as amended herein.

Claims 3 and 25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hirt (U.S. Patent 6,448,802) in view of Krug (U.S. Patent 4,961,053). Claim 3, dependent from claim 1, further recites that the visual functional indicator is located external to the die which further saves integrated circuit space. Krug teaches a test circuit wherein a display device 7 is used for an entire wafer and is located at the edge of a wafer. Significant conductive routing must be implemented from each die to the display device 7. In addition to taking up scribe area for this function, there are reliability issues associated with connectivity that is required. Also, signal timing issues must be taken into consideration for signaling from one side of a wafer to the other side. Neither Hirt nor Krug, nor the combination teach or suggest using a visual indicator for multiple modules for each of a plurality of integrated circuit die of a wafer and locating the visual indicator on the die or in close proximity to the die.

Claims 7, 9 and 26 were indicated to be allowable if rewritten in independent form to include the base limitations. The claims are presented herein in independent form from their base claim and allowance thereof is therefore requested.

DOCKET NO. SC11767TC

Applicants respectfully request consideration of the amendments and the allowance of claims 1-9 and 20-26, thereby placing the application in condition for allowance. Should issues remain that might be subject to resolution through a telephonic interview, the Examiner is requested to telephone the undersigned at (512) 996-6839.

Respectfully submitted,


Robert L. King
Reg. No.: 30,185
Tel. No.: (512) 996-6839
Fax No.: (512) 996-6854

SEND CORRESPONDENCE TO:
Motorola, Inc.
Law Department
Customer Number: 23125